Illinois Department of Transportation
2300 South Dirksen Parkway / Springfield, Illinois / 62764

Safety Engineering Policy Memorandum

Safety 4-08
Work Zone Safety Supplemental Policy, Subpart K to Title 23 CFR Part 630
Effective December 4, 2008

Overview

The Federal Highway Administration (FHWA) added a new Subpart K to 23 CFR Part 630 to supplement existing regulations that govern work zone safety and mobility in highway and street work zones. It includes conditions for appropriate use of, and expenditure for, positive protection between workers and motorized traffic, uniformed law enforcement officers, and installation and maintenance of temporary traffic control devices during construction, utility and maintenance operations. These regulations are intended to decrease the likelihood of fatalities and injuries to road users and workers exposed to motorized traffic. Illinois Department of Transportation (IDOT) was already in substantial compliance with many of the provisions of the supplemental regulations. This policy will ensure full compliance by more fully addressing key areas of work zone safety.

This policy is effective on December 4, 2008 and the stated design and planning guidance will be used in project development for any state projects, or local Federal-aid highway projects initiated after that date. The target for full implementation of this policy will be for all projects going to the November 2009 letting or after. Exceptions to this policy may be requested through the Bureau of Safety Engineering (BSE).

Guidance for Use of Positive Protection Devices

Introduction

There are many instances where workers are working on the pavement adjacent to traffic lanes and are only separated from traffic by channelizing devices. In accordance with 23 CFR 630.1106 and 630.1108, the management of work zone impacts shall include the consideration and management of highway worker safety on federal-aid highway projects and the use of positive protection devices. This policy establishes requirements and provides guidance for addressing worker and motorist safety by providing positive protective devices to limit the exposure and risk from motorized traffic in order to decrease the likelihood of fatalities or injuries to workers and prevent the intrusion of motorized traffic into the work space on all state and federal-aid highways.

The following definitions shall apply to this policy:
Motorized Traffic means the motorized traveling public and does not include motorized construction or maintenance vehicles and equipment within the work zone.

Positive Protection Devices means the devices that contain and/or redirect vehicles and meet the crashworthiness evaluation criteria contained in NCHRP report 350. This can include approved longitudinal barriers or truck/trailer mounted attenuators (TMA).

Work Zone Safety Management means the entire range of traffic management and control and highway safety strategies and devices used to avoid crashes in work zones that can lead to worker and road use injuries and fatalities, including positive protection devices, exposure control measures and other traffic control measures.

Positive Protection Devices
Positive protection devices should be considered in work zone situations that place workers at increased risk from motorized traffic, and where positive protection devices offer the highest potential for increased safety for workers and road users. For local roads with Average Daily Traffic (ADT) of less than or equal to 400, barricades may be used in lieu of positive protection based on engineering judgment. The following describes conditions where work is conducted under traffic and positive protection is required:

1. **Mobile** operations are defined as work that moves intermittently or continuously, (at approximately 1 mph, a walking pace).

   - Multi-lane highways
     A mobile operation may be accomplished using a standard lane closure as shown in the Highway Standards (or IDOT Work Site Protection Manual for IDOT employees) where the lane is closed using signing, arrow boards and channelizing devices. If such a standard lane closure is not used, then positive protective devices such as TMA's shall be used to close the lane in advance of the workers. The use of additional signing would be dependent upon the speed and the length of the work and shall be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).

   -Two lane highways
     Mobile operations on two lane highways will require the use of a positive protection device such as a TMA in advance of the work.

   TMA's are acceptable for limited daily work hours consistent with the IDOT Work Site Protection Manual.

2. **Stationary** operations are defined as work that occupies a location for more than one hour. In these cases the work would require a lane closure in accordance with an appropriate Highway Standard.

   Positive protection devices will be required for stationary operations conducted under traffic in areas that offer no means of escape from motorized traffic based on engineering judgment (e.g., tunnels, bridges, bridge painting, narrow medians, etc.) as follows:

   -Multi-lane highways that occupy a location for more than 24 hours, or require multiple days/nights setups exceeding 24 hours to complete, will require the use of temporary longitudinal traffic barriers when no means of escape for workers exists.

   -Two-lane highways that occupy a location for more than four days per stage will require the use of temporary longitudinal traffic barriers when no means of escape for workers exists.

   -TMA use is permitted in instances where workers are present for only shorter durations in the work zone. (e.g., stage shifts, extended time for curing). If workers are present for over 24 cumulative hours duration, temporary longitudinal traffic barrier should be considered as indicated above, unless TMA's are justified based upon an engineering study.

Positive protection devices should be used in accordance with the Highway Standards, MUTCD, manufacturers' requirements and NCHRP 350. Their use provides greater protection for workers than normal channelizing devices; however, workers should be aware of the limitations of positive protection devices.

Emergency situations and traffic incidents should consider use of positive protection devices in accordance with Chapter 6-I of the current MUTCD. Incidents lasting more than 24 hours should be evaluated for appropriate use of positive protection devices.

When developing the Transportation Operations Plan, designers should take emergency situations into consideration.

Design Policy to Minimize Drop-off Exposure

Changes in elevation along highways present exposure to risk for highway users, especially vulnerable users such as motorcyclists. Exposure can be limited by reducing speed, increasing lateral distance to the drop-off, providing a transition, or barrier.

Drop-off is defined as an elevation difference between lanes, or the traveled lane and shoulder, as traversed by the wheel of a motor vehicle.

The following tables provides policy for designers in preparing project plans.

Condition I

Drop-off Between Traveled Lanes, excluding pavement patching (1)

Drop-off Location	Speed (2)	Drop-off Height and Type (inches)	Physical Treatment (3,4)	Additional Requirements
Between Lanes	≥ 45 mph	≤ 1 in lift difference Or ≤ 1 in vertical milled face	None	None
		> 1, ≤ 2 in lift difference Or > 1, ≤ 1.5 in vertical milled face	None	Uneven lane signs (*2* mile spacing on Interstate & Expressway) (1 mile spacing on rural highway) (Spacing as per the TCP on urban sections)
		> 2, ≤ 4 in lift difference	Notched longitudinal wedge (6)	
		> 1.5, ≤ 4 in vertical milled face	Temporary wedge or milled sloped edge min 1:3 (6)	
		> 4, ≤ 12 in (5)	Lane closure using channelizing devices	As per lane closure standard
		> 12 in	Lane closure using temporary traffic barrier	
Between Lanes	< 45 mph	≤ 1 in lift difference Or ≤ 1.5 in vertical milled face	None	None
		> 1, ≤ 2.5 in lift difference	None	Uneven lane signs
		> 2.5, ≤ 4 in lift difference	Notched longitudinal wedge (6)	
		> 1.5, ≤ 4 in vertical milled face	Temporary or milled sloped edge min of 1:3 (6)	
		> 4, ≤ 12 in (5)	Lane closure using channelizing devices	As per lane closure standard
		> 12 in	Lane closure using temporary traffic barrier	

(1) For local roads less than or equal to 400 ADT, barricades may be substituted for temporary traffic barrier based on engineering judgment.

(2) Posted regulatory speed in work zone during the work activity

(3) Channelizing devices and temporary barrier are to be placed at same level as traveling lane.

(4) Channelizing devices may be placed at the drop-off elevation to preserve lane width. The reflective area and warning light (if required) shall be raised to the elevation above traveling lane as required by Standard 701901.

(5) Drop-off > 4 in and ≤ 12 in is permitted for < 0.5 mile length of drop-off exposure in work zone or < 48 hour closure time. Length and duration of drop-off in excess of limits shall require temporary traffic barrier. Adjacent work spaces that are essentially continuous in drop-off exposure should be considered as one work zone.

(6) Or the same physical treatment and sign requirements as > 4, ≤ 12 in.

Condition II

Drop-off at Edge of Pavement (1)

Drop-off Location	Speed (2)	Drop-off Height and Type (inches)	Treatment Required
≤ 3 ft from edge of pavement (3,4)	all	≤ 1 in	None
		> 1, ≤ 3 in	Low Shoulder signs (2 mile spacing)
	< 45 mph	> 3, ≤ 18 in	Place channelizing devices at 50 ft spacing
	≥ 45 mph	> 3, ≤ 12 in	Place channelizing devices at 100 ft spacing
	< 45 mph	> 18, ≤ 24 in for < 0.5 mile or <48 hours (6)	Place channelizing devices at 50 ft spacing
	≥ 45 mph	> 12, ≤ 18 in for < 0.5 mile or < 48 hours.	Place channelizing devices at 100 ft spacing
	< 45 mph	> 18, ≤ 24 in	Closure using temporary traffic barrier
	≥ 45 mph	> 18, ≤ 24 in for < 0.5 mile or < 48 hours.	Closure using temporary traffic barrier
	all	> 24 in	Closure using temporary traffic barrier
> 3 ft ≤ 8 ft from edge of pavement (5)	all	≤ 1 in	none
		> 1, ≤ 3 in	Low Shoulder signs (2 mile spacing)
	< 45 mph	> 3, ≤ 24 in (6)	Place channelizing devices at 50 ft spacing
	≥ 45 mph	> 3, ≤ 24 in	Place channelizing devices at 100 ft spacing
	all	> 24 in	Closure using temporary traffic barrier
> 8 ft to clear zone (5)	< 45 mph	> 12, ≤ 24 in (6)	Place channelizing devices at 50 ft spacing
	≥ 45 mph	> 12, ≤ 24 in	Place channelizing devices at 100 ft spacing
	all	> 24 in	Closure using temporary traffic barrier

(1) For local roads less than or equal to 400 ADT, barricades may be substituted for temporary traffic barrier based on engineering judgment.

(2) Posted regulatory speed in work zone during the work activity

(3) Channelizing devices and temporary barrier are to be placed at same level as traveling lane or shoulder profile.

(4) Channelizing devices may be placed at the drop-off elevation to preserve lane width. The reflective area and warning light (if required) shall be raised to the elevation above traveling lane or shoulder profile as required by Standard 701901.

(5) Channelizing devices and temporary barrier are to be placed at same level as side slope profile to be fully visible.

(6) Length and duration may be exceeded for urban areas when engineering judgment indicates sight distance will be adversely affected by temporary barrier.

Law Enforcement in Work Zones

Enforcement is one of the four “E”s of highway safety; along with engineering, education and emergency medical services. Enforcement plays a unique and critical role in relation to work zones. Presence of law enforcement appropriately deployed in the vicinity of a construction project has proven effective in gaining compliance with posted speed limits to enhance work zone safety.

Current Illinois law supports increased fines for speeding in work zones. First offense results in a mandatory court appearance and a minimum $375 fine. A second offense within two years results in a minimum $1,000 fine and 90 day suspension. These fines include a surcharge amount which is deposited into the Transportation Safety Highway Hire-back Fund. For a $375 fine, $125 dollars is deposited into this fund. For a $1,000 fine, $250 dollars is deposited into this fund.

Advance warning signs are also required to warn drivers that the $375 minimum fine is in effect. Work zone fines are dependent upon the presence of work zone speed limit signs, and not the presence of workers. These fines can also be assessed for urban projects with the proper signage. On Interstate highways, 65 mph speed limits are dropped to 55 mph or less when lane closures or other conditions require a reduced speed for safer traffic operations. Where workers are present or based upon an engineering study, signs may post a further reduction to 45 mph or less.

Law enforcement may patrol work zones as part of normal duties; however, the following programs outline how IDOT formally utilizes enforcement in work zones.

Law enforcement patrols for Illinois Department of Transportation Work Zones can be provided in two different ways, either through the Hire-back Program or through the Annual Highway Program:

1. Hire-back Program (historically known as the Give’em A Brake Program (GABZ)) administered through the Central Bureau of Operations and funded by the state Transportation Safety Highway Hire-back Fund and State Construction Fund.

a. History of the Program

Beginning in 1989, the department’s work zone public awareness program utilized specially designed signing on many road projects, at rest areas, truck weigh stations, and at the entrances to the state. During 1990, a work zone safety video program based upon the "Give 'em a BRAKE" theme, complete with lesson plan and overhead transparencies, was developed for use in driver education classes.

An important element of the department's work zone public awareness program has been the extensive use of off-duty Illinois State Police (ISP) officers to control speeds and other motorist violations in work zones on the interstates and in other critical areas. During the 1989 through 2005 construction seasons, the hire-back of ISP for extra patrols in work zones was publicized as part of this program. By utilizing funds from the department's operations budget rather than a particular construction project, officers were able to be rotated between several work zones.

New legislation that increased the fines for speeding in work zones went into effect on January 1, 1996 which increased the minimum fine for speeding in work zones to $150 when workers are present. Further legislation raised the fine to a minimum of $375. In order to meet the requirements of the new legislation, IDOT developed new signing policies to standardize the posting of construction speed limits and warn drivers of the increased fines that are used in Illinois work zones throughout the construction season.

As of August 2004, Photo Speed Enforcement is another work zone enforcement option allowed by Illinois law. This program is also funded by the Transportation Safety Highway Hire-back Fund. The locations of these patrols are coordinated through the IDOT and ISP Districts with the guidance of the BSE.

b. Implementation of the Program

At the beginning of the construction season, a distribution of work-hours is allotted to the IDOT's BSE for the Photo Speed Enforcement Program, and to each IDOT district based upon the number of active projects and the number of hire-back hours available. Schedules are then made at the IDOT district level for the most effective use of the officers. From one to five work projects are patrolled by officers during a duty shift in an effort to increase their visibility and effect. The work hours are gathered from each IDOT district each fiscal year and distributed by the Bureau of Operations. IDOT districts may request additional work-hours if justified for special circumstances.

c. Photo Speed Enforcement Program

The Work Zone Photo Speed Enforcement Program is a partnership between IDOT, ISP and the Illinois Tollway. It is the first state-level program of its kind in the nation. Photo speed enforcement vans are deployed in work zones where workers are present to gain compliance with posted speed limits and enhance safety. The IDOT's BSE allocates hours to ISP Districts based upon van availability and IDOT construction projects that are conducive to deployment of the vans. ISP Districts then coordinate with appropriate IDOT districts and BSE to schedule and execute deployments of the vans at the planned locations. The same speeding fines apply to photo speed enforcement as any other work zone violation.

2. Annual Highway Program Funding for Enforcement on Specific Projects

a. History of the Program

Other work zone law enforcement contractual agreements may be planned in advance and dedicated to a particular construction project. Use on specific projects has gone by various names. The ISP Bridge Emergency Access Response (BEAR) was such a program used in 1998. This program designated hours that were paid by the Road Fund in the normal highway programming process. These projects utilized specific inter-governmental agreements with IDOT and ISP to patrol one specific project at times designated by the districts.

Chicago Area Projects/North Suburban Area Patrols (CAPS/NSAP) is a Chicago based contract with the IDOT and ISP to patrol construction projects in the Chicago area. This is an Inter-governmental contract for specific work zone projects in District 1, and is also funded through the Road Fund annual program monies.

b. Implementation of the Program

Unique contracts are required for each project utilizing enforcement through annual highway program funding. In all cases, the ISP are paid in full prior to assignment of officers. This program allows project planners and designers to designate enforcement for a specific project during the design stage. Projects that should consider use of planned enforcement include complex work zones with high speeds or high traffic volumes, especially those that may benefit from presence of enforcement over an extended period of time or that may use an excessive amount of hire-back funds.

Designers should indicate the need for presence of law enforcement as part of the Phase I and Phase II process in developing the project Transportation Management Plan. Designers should coordinate with Construction, Operations, and Programming Engineers to include this cost as an additional project expense in the highway program, as opposed to using annual allocation of hire-back hours, if it is warranted in order to ensure that dedicated law enforcement is provided in the work zone.

Enforcement Training

The Illinois State Police Academy trains all cadets on traffic direction, incident management, and traffic control devices. Curriculum is continually updated to coincide with the MUTCD and IDOT work zone policies. IDOT and ISP District personnel work together on specific projects to determine safe and effective deployment areas based upon site conditions.

Enforcement on Local Agency Projects

Local agencies are encouraged to consider similar programs for use on local jurisdiction projects that may benefit from enforcement presence in the work zone. Local agencies may develop their own local police hire-back programs or utilize federal highway funding to pay for enforcement activities on certain projects. Local hire-back programs may be established in accordance with the Illinois Vehicle Code 625 ILCS 5/11-605.1 (f-5), which states that "Each county shall create a Transportation Safety Highway Hire-back Fund. The county shall use all moneys in its Transportation Safety Highway Hire-back Fund to hire off-duty county police officers to monitor construction or other maintenance zones in that county on highways other than interstate highways." This may be funded by work zone speeding tickets written by police officers of that county, with the surcharge ($125 or $250 depending upon the violation) of each of these tickets to be deposited into that county's fund.

Emergency Traffic Patrols

The Emergency Traffic Patrol (ETP) is a Division within IDOT that operates in District 1 Chicago Region. The Emergency Patrol Vehicles (EPV) program performs similar functions in IDOT District 8 East St. Louis Region. ETP/EPV is responsible for responding/detecting any disruptive incident on assigned expressways and to initiate quick and safe clearance procedures that will restore traffic flow. The ETP are sometimes referred to as "Minutemen", and they provide surveillance and respond to freeway incidents 24 hours a day, 7 days a week. Expressway incidents can range from major multi-vehicle accidents, debris and spilled loads, to disabled vehicles. Each district should ensure appropriate notification and coordination with ETP/EPV for work zone operations.

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Attachments

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Safety Engineering Policy Memorandum

Update to Safety 4-08
Work Zone Safety Supplemental Policy, Subpart K to Title 23 CFR Part 630
Effective August 27, 2010

Overview

The following is an update to the Bureau of Safety Engineering Policy Memorandum Safety 4-08. Additional guidance has been added to the section 'Design Policy to Minimize Drop-off Exposure'.

This policy is effective on August 27, 2010, and the stated design and planning guidance will be used in project development for any state projects or local Federal-aid highway projects initiated after that date. The policy shall be fully implemented for all projects on the January, 2011 letting and after.

Design Policy to Minimize Drop-off Exposure

The following tables have been updated.

Condition I

Drop-off between Traveled Lanes, excluding Pavement Patching (1) (2)

Drop-off Location	Normal Posted Speed	Drop-off Height and Type (inches)	Physical Treatment (3,4)	Additional Requirements
Between Lanes	≥ 45 mph	≤ 1 in lift difference Or ≤ 1 in vertical milled face	None	None
		> 1, ≤ 2 in lift difference Or > 1, ≤ 1.5 in vertical milled face	None	Uneven lane signs (*2* mile spacing on Interstate & Expressway) (1 mile spacing on Rural Highway) (Spacing as per the TCP on Urban sections)
		> 2, ≤ 4 in lift difference	Notched longitudinal wedge (6)	
		> 1.5, ≤ 4 in vertical milled face	Temporary wedge or milled sloped edge min 1:3 (6)	
		> 4, ≤ 12 in (5)	Lane closure using channelizing devices	As per lane closure standard
		> 12 in	Lane closure using temporary traffic barrier	
Between Lanes	< 45 mph	≤ 1 in lift difference Or ≤ 1.5 in vertical milled face	None	None
		> 1, ≤ 2.5 in lift difference	None	Uneven lane signs
		> 2.5, ≤ 4 in lift difference	Notched longitudinal wedge (6)	
		> 1.5, ≤ 4 in vertical milled face	Temporary or milled sloped edge min of 1:3 (6)	
		> 4, ≤ 12 in (5)	Lane closure using channelizing devices	As per lane closure standard
		> 12 in	Lane closure using temporary traffic barrier	

(1) For local roads less than or equal to 400 ADT, barricades may be substituted for temporary traffic barrier based on engineering judgment.

(2) Spot locations for two lane, two way highways with continuous flagging or traffic signals may omit barrier for up to 96 hours.

(3) Channelizing devices and temporary barrier are to be placed at same level as traveling lane.

(4) Channelizing devices may be placed at the drop-off elevation to preserve lane width. The reflective area and warning light (if required) shall be raised to the elevation above traveling lane as required by Standard 701901.

(5) Drop-off > 4 in and ≤ 12 in is permitted for < 0.5 mile length of drop-off exposure in work zone or < 48 hour closure time. Length and duration of drop-off in excess of limits shall require temporary traffic barrier. Adjacent work spaces that are essentially continuous in drop-off exposure should be considered as one work zone.

(6) Or the same physical treatment and sign requirements as > 4 in, ≤ 12 in.

Condition II

Drop-off between Travel Lane and Shoulder/Edge of Pavement (1) (2)

Drop-off Location	Normal Posted Speed	Drop-off Height and Type (inches)	Treatment Required
≤ 3 ft (3,4)	all	≤ 1 in	None
		> 1, ≤ 3 in	Low Shoulder signs (2 mile spacing)
	< 45 mph	> 3, ≤ 18 in	Place channelizing devices at 50 ft spacing
	≥ 45 mph	> 3, ≤ 12 in	Place channelizing devices at 100 ft spacing
	< 45 mph	> 18, ≤ 24 in for < 0.5 mile or <48 hours (6)	Place channelizing devices at 50 ft spacing
	≥ 45 mph	> 12, ≤ 18 in for < 0.5 mile or < 48 hours.	Place channelizing devices at 100 ft spacing
	≥ 45 mph	> 12, ≤ 24 in for > 0.5 mile or > 48 hours	Closure using temporary traffic barrier
	< 45 mph	> 18, ≤ 24 in	Closure using temporary traffic barrier
	≥ 45 mph	> 18, ≤ 24 in for < 0.5 mile or < 48 hours.	Closure using temporary traffic barrier
	all	> 24 in	Closure using temporary traffic barrier
> 3 ft ≤ 8 ft (5)	all	≤ 1 in	none
		> 1, ≤ 3 in	Low Shoulder signs (2 mile spacing)
	< 45 mph	> 3, ≤ 24 in (6)	Place channelizing devices at 50 ft spacing
	≥ 45 mph	> 3, ≤ 24 in	Place channelizing devices at 100 ft spacing
	all	> 24 in	Closure using temporary traffic barrier
> 8 ft to work zone clear zone (5)	< 45 mph	> 12, ≤ 24 in (6)	Place channelizing devices at 50 ft spacing
	≥ 45 mph	> 12, ≤ 24 in	Place channelizing devices at 100 ft spacing
	all	> 24 in	Closure using temporary traffic barrier

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